



Bulletin of Popular Information

Volume 34

December, 1959

Number 12

CONIFERS OF THE MORTON ARBORETUM IX

Abies concolor (Gord.) Englem. Colorado Fir

In a section of the country known to be uncongenial to firs, we are fortunate in being able to grow this handsomest and most adaptable species native to the United States and one of the most important of seven true firs inhabiting the forests of the Pacific slope and the Rockies.

Like other firs, *Abies concolor* has flat, very flexible needles, smooth non-drooping twigs and branches, and cones which are borne erectly like candles on a Christmas tree. In addition to these generic characteristics it is marked by a number of individual distinctions. Its wide, blunt pointed, spirally arranged needles are unusually long, sometimes measuring 3 inches, widely spaced on the twigs and inclined to curve outward and upward. Their coloring is variable, ranging from silvery or sea green to yellowish with a blue cast. Some specimens outrival the bluest of Blue Spruces in showiness.

The contour of the Colorado Fir differs from most species, too, being conical rather than spire-like with a grace lacking in so many other forms. The branches on the upper half of the tree tend to point upward, the lower horizontal or deflected downward. There is nothing of the stiffness of outline frequently found in Blue Spruce and in some of the other conifers.

Within its natural range which extends southward from southern Oregon through California into Continental Mexico, and from Nevada, Utah and southern Colorado into New Mexico, it shows considerable variation in height. Maximum growth occurs in northern California, where on north or east slopes at moderate altitudes it may reach 150 or 200 feet and attain trunk diameters of 5 or 6. Under these conditions it is a massive tree whose dense, heavily foliated crown in all likelihood extends to the ground line. Fifty to sixty foot specimens are considered good sized locally.

Immature trunks are light gray in color and smooth, except for the conspicuous resin blisters typical of the firs. Age results in a hardening and thickening of the bark as it breaks into deep, longitudinal furrows 4 to 6 inches thick. It is fire resistant.

Colorado Fir flowers, being inconspicuous, escape the notice of all but the most observing. Those of both sexes occur on the same tree on branches of the previous year's growth, the pistillate erect and singly on the uppermost branches, the staminate hanging from the undersides of the lower limbs. The cones following mature during a single season, cylindrically shaped strobiles narrowed at the ends and from 3 to 5 inches long. They may vary from olive green to purplish brown in color. The thin, one inch scales of which they are composed fall apart at maturity releasing the shiny, brownish winged seeds to the wind. The spiked central axes to which they were attached remain on the branches.

While withstanding heat, drouth and cold equally well, the Colorado Fir actually prefers a moist, well drained clay loam with a gravelly subsoil. And, although full sunlight is preferable, it will tolerate light shade. Classed as a moderate grower, specimens in the Arboretum plots have shown an average annual growth of from 1.5 to 2 feet. Some of the shapeliest specimens are to be found in the Thornhill Grounds, along



Pseudotsuga taxifolia (Poir.) Britt. Douglas Fir, in the Morton Arboretum Conifer Collection.

Forest Road and in the Conifer Collection along the extension of the Hedge Garden axis.

Pseudotsuga taxifolia (Poir.) Britt. Douglas Fir

Although discovered by Archibald Menzies, the English Botanist, in 1775 on the west coast of Vancouver Island, it was David Douglas, the Scottish botanist and explorer for whom the Douglas Fir was named and who in 1827 collected the seeds from which the tree was first grown in England.

An analysis of the scientific name, *Pseudotsuga taxifolia*, "false hemlock with a yew-like leaf", creates somewhat of a botanical puzzle, for the Douglas Fir also shows in its make-up characteristics of the firs as well as a resemblance to certain spruces. Its likeness to the firs is evident in its soft, flat and almost blunt-tipped needles, grooved on the upper surface and with a white band on either side of a prominent midrib



Abies concolor (Gord.) Engelm. Colorado Fir, one of the handsomest and most adaptable native species. This twenty foot specimen is along the extension of the Hedge Garden axis.

beneath. They vary in size from $\frac{1}{2}$ to $1\frac{1}{2}$ inches, and being arranged more or less spirally on the branches impart a full, rounded appearance. Like true firs they leave a smooth circular scar when pulled from the stem. Colorwise the range is from darkest green to glaucous silvery blue. Long pointed, reddish brown winter buds add a less orthodox note.

The oval cones are another non-conforming feature, being pendulous instead of erect, 2 to 4 inches long and light brown in color. It is the peculiar three-pronged bracts inserted between their rounded scales, however, which set them apart. The winged seeds borne in twos at the base of the scales mature in the autumn of the first year. Although in all probability overlooked, the spring borne flowers are not without interest, the axillary cylindric staminate ones and the terminal three lobed pistillate inflorescences. Both are reddish.

This widely distributed western tree, whose range extends from British Columbia to California, Montana, Colorado, west Texas and northern Mexico, exhibits an amazing adaptability, growing as it does from sea level in northern coastal areas where the yearly rainfall totals 100 inches up to altitudes close to 11,000 feet with annual precipitation totals of 15 inches or less. As would be expected, geographical location determines mature height, general habit, foliage color and hardness. Trees up to 325 feet tall with trunk diameters of 10 to 17 are on record in favorable parts of the range,—magnificent specimens with shafts clear of branches up to a third of their height. Such trees are obviously exceptions. In cultivation specimens reaching a third of this size would be noteworthy. A broad pyramidal symmetry characterizes the Douglas Fir in all stages of its development, though forest specimens fail to maintain their basal growth. The branches are arranged on the trunks in irregular whorls, the upper ones extending outward at acute angles, the center ones horizontally and the lower drooping, but all upturned at the ends. Pendent branchlets add a special distinction. A look at Douglas Fir bark shows that of young trees to be light gray, thin and smooth. With age, however, it becomes grayish brown, thick, corky and deeply furrowed into scaly ridges. On old trees it may even reach a foot in thickness.

For severe climates such as our own the geographical strain of Douglas Fir from the east slope of the Rockies is the recommended one. Rapid growing, wind resistant, tolerant of some shade and retentive of its lower branches, it is both attractive and functional. Its value as a lawn specimen, screening or windbreak subject is widely recognized.

The Arboretum boasts many fine specimens of Douglas Fir, the oldest being along the Main Drive to the Thornhill grounds. There are other plantings in the Conifer Collection east of the Hedge Garden and along Forest Road

E L. Kammerer

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Published monthly by The Morton Arboretum, Lisle, Ill. Subscription \$1.00 a year; single copies 10c; double copies 20c